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Wastewater Feasibility Study

Flora Springs Winery P15-00111-MOD
Planning Commission Hearing Date May 3, 2017

May 2016
Job No. 96-19

BARTELT ENGINEERING

WASTEWATER FEASIBILITY STUDY FOR THE FLORA SPRINGS WINERY 1978 WEST ZINFANDEL LANE, ST. HELENA, CA 94574 PARCEL 4 (PREVIOUSLY APN 027-100-037)

As required by Napa County Planning, Building & Environmental Services, this study outlines the feasibility of providing onsite wastewater dispersal for a potential increase of the staffing and marketing plan at Flora Springs Winery located on the above referenced parcel. The subject parcel, previously APN 027-100-037, has been distinguished as "Parcel 4" per the pending Lot Line Adjustment (reference #W15-00140).

PROJECT DESCRIPTION

The purpose of this study is to evaluate the feasibility of a moderate change to the staffing and marketing plan while continuing to operate an existing 120,000 gallon per year winery. The Applicant proposes sixteen (16) full-time employees, one (1) part-time employee and seven (7) harvest season employees. The Applicant also proposes to offer private tour and tasting appointments for a maximum number of 100 guests per day. Furthermore, the Applicant proposes to offer two (2) food and wine - lunch pairing events per week for parties up to 50 guests and two (2) food and wine - dinner pairing events per week for parties up to 25 guests. Additionally, the Applicant proposes to continue to host two (2) wine club events per week for groups of up to 50 guests. Wine club release events are proposed to occur three (3) times a year for parties up to 250 guests along with one (1) wine club release event – TRILOGY per year for parties up to 350 guests. Additionally, one (1) auction related event will occur per year for up to 60 guests. Table 1 summarizes the proposed marketing plan:

TABLE 1: MARKETING PLAN SUMMARY

Description	Current		Proposed	
	Frequency	Guests	Frequency	Guests
Private Tours & Tastings	Daily	25 per day	Daily	100 per day
Food & Wine Pairings - Lunch	4 per month	25 per event	2 per week	50 per event
Food & Wine Pairings - Dinner	1 per month	25 per event	2 per week	25 per event
Wine Club Events	2 per week	50 per event	2 per week	50 per event
Wine Club Release Events	3 per year	250 per event	3 per year	250 per event
Wine Club Release Events - TRILOGY	1 per year	350 per event	1 per year	350 per event
Auction Related Events	1 per year	30 per event	1 per year	60 per event

Table 2 summarizes the proposed staffing plan:

TABLE 2: STAFFING PLAN SUMMARY

Employment Description	Staff Members	
	Current	Proposed
Full-Time Employee	12	16
Part-Time Employee	4	1
Harvest Season Employee	0	7

As part of our services, representatives from Bartelt Engineering have reviewed the operational methods for the winery with our Client, reviewed the parcel files at Napa County Environmental Health, held conversations with Napa County Environmental Health staff, performed a reconnaissance of the site to view existing conditions, reviewed site evaluations performed on November 4 & 21, 2002 and design calculations prepared by Sterk Engineering dated August 15, 2004 to evaluate the feasibility of continuing to utilize the existing wastewater dispersal system with the proposed expanded staffing and marketing plan.

This study will demonstrate that the proposed increase to the staffing and marketing plan can feasibly be developed and that the parcel can adequately dispose of all wastewater onsite.

WASTEWATER ANALYSIS

Winery Production Process Wastewater Flow

The winery facility's production wastewater flow rates for harvest and non-harvest seasons can be calculated as follows:

Harvest Peak Winery Process Wastewater Flow =

$$\left(\frac{120{,}000\ \text{gallons of wine}}{\text{year}}\right)\times\left(\frac{1.5\ \text{gallons of water}}{1\ \text{gallon of wine}}\right)\times\left(\frac{1\text{year}}{60\ \text{days of crush}}\right)=$$

Harvest Peak Winery Process Wastewater Flow = 3,000 gallons per day (gpd)

Non-Harvest Peak Winery Process Wastewater Flow =

$$\left(\frac{120{,}000\ \text{gallons of wine}}{\text{year}}\right)\times\left(\frac{3.0\ \text{gallons water}^{1}}{1\ \text{gallon of wine}}\right)\times\left(\frac{1\ \text{year}}{305\ \text{days}}\right)=$$

Non-Harvest Peak Winery Process Wastewater Flow = 1,180 gpd

[1] Water to wine ratio was reduced based on information provided by Flora Springs Winery. See Bartelt Engineering correspondence to Paul Steinauer dated April 7, 2009 enclosed with this study.

Winery Sanitary Wastewater Flow

The sanitary wastewater generated at the winery production facility and tasting room including full-time employees, part-time employees, harvest season employees and guests can be itemized as follows:

Employees:

- 16 Full-Time Employees x 15 gpd per employee = 240 gpd
- 1 Part-Time Employee x 15 gpd per employee = 15 gpd
- 7 Harvest Season Employees x 15 gpd per employee = 105 gpd

Guests[2,3]:

- Private Tours and Tasting:
  - (100 guests per day) x (3 gpd per guest) = 300 gpd per day
- Food and Wine Pairings - Lunch:
  - (50 guests per event) x (5 gpd per guest) = 250 gpd per event
- Food and Wine Pairings - Dinner:
  - (25 guests per event) x (5 gpd per guest) = 125 gpd per event
- Wine Club Events:
  - (50 guests per event) x (5 gpd per guest) = 250 gpd per event
- Wine Club Release Events:
  - (250 guests per event) x (5 gpd per guest) = 1,250 gpd per event
- Wine Club TRILOGY Release Events:
  - (350 guests per event) x (5 gpd per guest) = 1,750 gpd per event
- Auction Related Events:
  - (60 guests per event) x (5 gpd per guest) = 300 gpd per event

Although the proposed expansion to the sanitary wastewater system includes wastewater generated from the largest event, portable toilets will be utilized during events with over 100 guests. The portable toilets will provide additional restrooms for guests to use near the event areas.

[2] Volume rate accounts for 3 gpd to 5 gpd for kitchen and restroom use (event dependent). Events will continue to be catered.

[3] Represents a maximum event that may occur during harvest or non-harvest seasons.

Total Harvest Season and Non-Harvest Season Peak Sanitary Wastewater Flow

The total proposed harvest season peak sanitary wastewater flow is the combination of the winery production facility and tasting room sanitary wastewater flows during the months of September through November (harvest). The total proposed non-harvest season peak sanitary wastewater flow is the combination of the winery production facility and tasting room sanitary wastewater flows during the months of December through August (non-harvest).

Table 3 below outlines the proposed marketing event schedule. An "X" in each column represents which events can occur on the same day. For example, Private Tours and Tastings can occur on the same day as Food and Wine Pairings – Lunch and Dinner during both harvest and non-harvest seasons. The allowed daily visitors during non-marketing events is 100 guests on days where other non-marketing events are held and the number of visitors allowed for tours and tastings will be reduced so as to not exceed 100 total guests per day.

TABLE 3: HARVEST AND NON-HARVEST PROPOSED DAILY EVENT SCHEDULE

Event	Daily Occurrence							
	Harvest			Non-Harvest				
Private Tours and Tasting	X	X	X	X	X			X
Food and Wine Pairings - Lunch		X		X				
Food and Wine Pairings - Dinner		X		X				
Wine Club Events			X		X			
Wine Club Release Events						X		
Wine Club TRILOGY Release Event							X	
Auction Related Events								X

Using the marketing schedule outlined in Table 3, the greatest sanitary wastewater generating combination of events for a single day during the harvest and non-harvest seasons can be calculated. Table 4A below outlines the sanitary wastewater flows generated by employees and guests during a particular event in harvest and non-harvest seasons.

TABLE 4A: HARVEST AND NON-HARVEST SEASON DAILY SANITARY WASTEWATER FLOWS									
	Employees	Private Tours and Tasting	Food and Wine Pairings		Wine Club Event	Wine Club Release Events	Wine Club Release Event- TRILOGY	Auction Related Events	Total
			Lunch	Dinner					
	Daily Occurrence (gpd)								
Harvest	360	300							660
	360	75	250	125					810
	360	150			250				760
Non-Harvest	255	300							555
	255	75	250	125					705
	255	150			250				655
	255					1,250			1,505
	255						1,750		2,005
	255	120						300	675

Table 4A shows that the greatest sanitary wastewater flow occurs in the non-harvest season during the Wine Club Release Event - Trilogy. The greatest practical harvest and non-harvest season peak process and sanitary wastewater flows are summarized in the following table:

TABLE 4B: HARVEST AND NON-HARVEST SEASON PEAK WASTEWATER SUMMARY		
Wastewater Source	**Harvest** (gpd)	**Non-Harvest** (gpd)
Process Wastewater	3,000	1,180
Sanitary Wastewater	810	2,005
Combined Wastewater	3,810	3,185

The greatest total proposed daily wastewater flow is the combination of the greatest winery facility's production flow and the winery production facility and tasting room sanitary wastewater flows that occur in the same season and on the same day.

WASTEWATER EFFLUENT DISPERSAL METHODS

Existing Pressure Distribution Septic System

Currently wastewater dispersal at the Flora Springs Winery facility is through the use of an underground pressure distribution system designed by Sterk Engineering, Inc. in August 2004 and constructed in the fall of 2004. The existing system was designed to accommodate a peak flow of 3,300 gallons per day. The existing system will need to be modified to accommodate the expected increase in peak wastewater flow over the design capacity of the existing dispersal system.

The existing dispersal field includes two (2) zones with 756 lineal feet (lf) of trench length (1,512 lf total). Each zone is divided into three (3) equal subfields containing 3 lines each 84 lf long (252 lf per subfield). The existing 1,500 gallon sump tank, which temporarily holds both process wastewater and sanitary wastewater, uses a duplex pumping system. Each of the pumps serves its own zone.

The winery facilities' process wastewater system consists of several steps. The floors of the winery, crush pad and caves are sloped so that all process wastewater is collected in trench drains and floor drains. The drains are fitted with baskets to collect a majority of the larger debris. The winery process wastewater collected in the trench drains and floor drains then gravity flow into process wastewater tanks fitted with filters to remove finer solids. From the process wastewater tanks, the process wastewater effluent combines with the winery and tasting room sanitary wastewater effluent before being pumped to the dispersal field through a sump tank.

SEPTIC TANK SIZING

Existing Septic Tanks

There are currently five (5) 1,500 gallon septic tanks and four (4) 2,000 gallon septic tanks handling the process and sanitary wastewater flows; of these tanks one (1) 1,500 gallon septic tank and one (1) 2,000 gallon septic tank receive the sanitary sewer wastewater flows from the "red wine" winery building and the "white wine" winery building, respectively. Both sanitary septic tanks were sized using a design load of 273 gallons per day (see Sterk Engineering design calculations). The remaining septic tanks are also divided between the two (2) winery buildings and processing areas; with four (4) 1,500 gallon septic tanks handling the process wastewater flows from the interior drains of the "red wine" winery and caves and three (3) 2,000 gallon septic tanks handling the process wastewater flows from the "white wine" winery and all outdoor processing areas. Two (2) of the 2,000 gallon septic tanks servicing the "white wine" winery were proposed by Bartelt Engineering and constructed as an addition to the existing system in 2009. The premise of the expansion is explained in the enclosed letter to Paul Steinauer from Bartelt Engineering dated April 7, 2009.

PROPOSED EXPANSION TO EXISTING WASTEWATER DISPERSAL SYSTEM

The proposed change to the staffing and marketing plan will increase the maximum sanitary wastewater design flow to 2,005 gallons per day. Bartelt Engineering proposes installing an additional 2,000 gallon sanitary septic tank in series with the current 1,500 gallon tank serving the "red wine" winery building where marketing events are expected to be held. The additional 2,000 gallons of sanitary septic tank capacity will allow for a hydraulic retention time of 1.5 days during the largest marketing events and four (4) days of hydraulic retention time on an average day.

To accommodate the peak combined wastewater flow of 3,810 gallons per day the existing pressure distribution system, which has a design capacity of 3,300 gallons per day, is proposed to be expanded to handle the additional 510 gallons per day from the proposed staff and marketing plan changes. The total length of leach line laterals is proposed to increase from 1,512 lf to 2,016 lf. Two (2) new subfields would be added each containing 252 lf of trench. Trench dimensions for the two (2) proposed subfields would duplicate the current design prepared by Sterk Engineering, Inc. The dispersal field would be reconfigured to include two (2) zones with 1,008 lf of trench length (2,016 lf total). Each zone would be divided into four (4) equal subfields. Each subfield would contain three (3) lines each 84 lf long (252 lf per subfield). Refer to the attached Pressure Distribution System Design Calculations for more information on sizing the dispersal field expansion.

A replacement area sized to accommodate 100% of the minimum required absorption area has been placed adjacent to the proposed dispersal field expansion. The existing pumps have adequate power and head to convey the increase in design flow.

CONCLUSIONS

Sanitary wastewater generated as a result of the proposed staffing and marketing plan increase for the existing 120,000 gallon winery can be feasibly accommodated by expanding the existing pressure distribution system. There is adequate room for the installation of a new sanitary septic tank and new leach line laterals which will allow Flora Springs Winery to host marketing events while maintaining Napa County Standards for their wastewater system.

REFERENCES

Bartelt Engineering. "Flora Springs Winery." Napa, 2009.

California Onsite Wastewater Association (COWA). "Pumping and Pressure Distribution Systems." May 1998.

Napa County Department of Environmental Management. "Design, Construction and Installation of Alternative Sewage Treatment Systems." April 12, 2010.

Sterk Engineering, Inc. "Pressure Distribution Field Support Data." Calistoga, 2004.

U.S. Department of Health, Education and Welfare, Public Health Service Publication. *Manual of Septic-Tank Practice.* 1967.

U.S. Environmental Protection Agency. "Onsite Wastewater Treatment Systems Manual." February 2002.

Napa County Planning, Building and Environmental Services, "Napa County Onsite Wastewater Treatment Systems (OWTS) Technical Standards." Final Draft.

BARTELT ENGINEERING

PRESSURE DISTRIBUTION WASTEWATER SYSTEM DESIGN CALCULATIONS

Project Details

Date:	May 2016
Project Name:	Flora Springs Winery
Project Address:	1978 W. Zinfandel Lane
Project APN:	Parcel 4 (previously APN 027-100-037)
Job Number:	96-19
Design By:	Rich Paxton, P.E.

Perc Rate:

Assigned Perc Rate	**4**	inches per hour
Assigned Perc Rate	15	minutes per inch
Converted Perc Rate	0.729	gallons / square foot / day

Trench Design:

Depth of Acceptable Soil (per Site Investigation)	**66**	inches
Design Depth of Lateral Invert Below O.G.	**10**	inches
Design Depth of Trench from Original Grade	**28**	inches
Design Depth of Gravel Cover to Backfill Over Lateral	**2**	inches
Required Additional Fill (OG to FG) to Meet Minimum Req	**5.5**	inches
Actual Depth of Lateral Invert Below F.G.	**15.5**	
Actual Depth of Trench from FG	**33.5**	
Required Separation to Limiting Condition	**36**	inches
Actual Separation to Limiting Condition	38	inches
Design Diameter of Lateral	**1.5**	inches
Actual Depth of Gravel Below Lateral Invert	18	inches
Sidewall Area (square feet / lineal foot)	**3.00**	square feet per lineal foot

Design Flow:

Winery Process Wastewater:	3000	gallons per day
Winery Sanitary Wastewater:		
Number of Full Time Employees	**16**	employee
Number of Part Time & Seasonal Employees	**8**	employee
Wastewater Generation Rate per Employee	15	gallons per day
Maximum Total Wastewater Generation from Guests	810	gallons per day
Estimated Percentage of Usage per Day	100%	
∴ Use Design Flow	3,810	gallons per day

BARTELT ENGINEERING

PRESSURE DISTRIBUTION WASTEWATER SYSTEM DESIGN CALCULATIONS

Dispersal Field Design:		
Calculated Required Length of Trench	1,742.1	lf
Use Length of Trench	2,016	lf
Number of Zones	2	
Calculated Length of Trench per Zone	1,008	lf
Number of subfields per zone	4	
Lineal feet per subfield	252	lf
Lateral Length	84	lf
Number of Lines per subfield	3	
Actual Length of Trench per Subfield	252	
Actual Total Length of Trench	2,016	
Factor of Safety	1.16	

April 7, 2009
#96-19

Paul Steinauer
Flora Springs Winery
1978 West Zinfandel Lane
Saint Helena, CA 94574

Re: Flora Springs Winery, 1978 West Zinfandel Lane, Napa County, CA APN 027-100-037

Dear Mr. Steinauer:

The purpose of this report is to examine the feasibility of disposing wine barrel process rinsate through the existing pressure distribution disposal field without exceeding the disposal field design parameters while maintaining daily winery operations.

The existing Flora Springs Winery facility includes two existing winery buildings, an existing tasting room and existing administrative offices. The winery buildings are currently being utilized for crushing and fermentation of still wines, bulk wine aging, storage and bottling. The existing administrative offices include general/secretarial, general office/break room, restroom and circulation area. The winery facility is permitted for a production of 120,000 gallons of wine per year with public tours and tastings for up to 25 visitors allowed on site per day. Flora Springs Winery currently employs 12 full-time and 4 part-time employees at this facility.

As part of our work, we have reviewed the files at Napa County Department of Environmental Management, held conversations with Napa County Department of Environmental Management Staff and performed a reconnaissance of the site to view the existing condition of the winery process and sanitary sewer disposal system.

This study is based on the design drawings and calculations for the existing engineered septic system prepared by Sterk Engineering, Inc., and the "Topographic Map of a Portion of the Lands of Flora Springs" prepared by Michael Brooks and Associates, Inc., dated January 2001 and revised March 2002, September 2002 and August 2003.

Existing Engineered Septic System

Currently, wastewater disposal at the Flora Springs Winery facility is through the use of an underground Pressure Distribution System designed by Sterk Engineering, Inc. in August 2004 and constructed in the Fall of 2004. The existing system was designed to handle a peak flow of 3,300 gallons per day (gpd). Engineered plans and calculations for the Pressure Distribution System prepared by Sterk Engineering, Inc. are on file with Napa County Department of Environmental Management.

Existing Sanitary Wastewater Flow

As discussed above, the sanitary wastewater flow generated by employees and tours and tasting is based on 12 full-time employees, 4 part-time employees and 25 visitors per day.

The peak sanitary wastewater flow can be calculated as follows:

12 full-time employees (15 gpd) = 180 gpd

4 part-time employees (7.5 gpd) = 30 gpd

25 visitors (2.5 gpd per visitor) = 62.5 gpd

Peak Sanitary Wastewater Flow = 180 gpd + 30 gpd + 62.5 gpd = 272.5 gpd, use 300 gpd

Existing Process Wastewater Flow

It is assumed that the winery uses six gallons of water per year per gallon of wine produced and that one and one-half gallons of the six gallons is used during the crush period. The winery has a production of 120,000 gallons of wine per year and it is estimated that the crush period will be 60 days. The peak and average process wastewater flow from the winery can be calculated as shown below:

Peak winery process wastewater flow =

$$\frac{120{,}000 \text{ gallons of wine} \left(1.5 \text{ gallons of water per } 1 \text{ gallon of wine}\right)}{60 \text{ days of crush}} = 3{,}000 \text{ gpd}$$

Average winery process wastewater flow =

$$\frac{\textit{120,000 gallons of wine per year} \left(\textit{6 gallons of water per 1 gallon of wine}\right)}{\textit{365 days per year}} = \textit{1,973 gpd}$$

Existing Barrel Rinse Process Wastewater Flow

Based on information provided by Flora Springs Winery, the current barrel rinse program is a two step process. The first step is a 4 minute hot water rinse at 5.5 gallons per minute (gpm); the second step is a 3 minute ozone rinse at 15 gpm. It is our understanding that approximately 100 barrels can be cleaned during a normal business day and that barrel cleaning can potentially occur for four consecutive days. The process wastewater flow for the current barrel rinse program can be calculated as shown below:

4 minute hot rinse (5.5 gpm) = 22 gallons / barrel

3 minute ozone rinse (15 gpm) = 45 gallons / barrel

Barrel Rinse Wastewater Flow per Barrel = 22 gal / barrel + 45 gal / barrel = 67 gal / barrel

Barrel Rinse Wastewater Flow per Day = (67 gal / barrel) x (100 barrels / day) = 6,700 gpd

Barrel Rinse Wastewater Flow for four (4) consecutive days = (4 days) x (6,700 gpd)
= 26,800 gallons

Proposed Barrel Rinse Wastewater Metering Based on Current Barrel Rinse Program

The proposed barrel rinse wastewater metering is based on maintaining a 300 gpd sanitary sewer wastewater flow and a 500 gpd of winery process wastewater flow thus allowing for a metering rate of 2,500 gpd.

	Day 1	Day 2	Day 3	Day 4
Barrel Wastewater [gal]	6,700	6,700	6,700	6,700
Metering Flow [gal]	2,500	2,500	2,500	2,500
End of Day Balance [gal]	4,200	8,400	12,600	16,800

Table 1: Barrel Wastewater Surge Calculation

Table 1 indicates that at the end of four consecutive days approximately 16,800 gallons of barrel rinse wastewater remains to be metered into the process wastewater disposal system. At a rate of 2,500 gpd it will take approximately 6.7 additional days to meter the remaining barrel rinse wastewater into the process wastewater disposal system.

Tom Beard Company Barrel Washing System

Based on information for the Tom Beard Barrel Washing System the barrel wash cycle runs approximately 5 minutes at 5 gpm per spray head. The 5 minute cycle time accounts for both a hot water rinse and an ozone rinse. Based on the previously stated barrel washing schedule, the process wastewater flow for the Tom Beard Barrel Washing System can be calculated as shown below:

2.5 minute hot rinse (5 gpm) = 12.5 gallons / barrel

2.5 minute ozone rinse (5 gpm) = 12.5 gallons / barrel

Barrel Rinse Wastewater Flow per Barrel = 25 gal / barrel

Barrel Rinse Wastewater Flow per Day = (25 gal / barrel) x (100 barrels / day) = 2,500 gpd

Barrel Rinse Wastewater Flow for four (4) consecutive days = (4 days) x (2,500 gpd)
= 10,000 gallons

Proposed Barrel Rinse Wastewater Metering Based on Tom Beard Barrel Washing System

The proposed barrel rinse wastewater metering is based on maintaining a 300 gpd sanitary sewer wastewater flow and 500 gpd of winery process wastewater flow thus allowing for a metering rate of 2,500 gpd.

	Day 1	Day 2	Day 3	Day 4
Barrel Wastewater [gal]	2,500	2,500	2,500	2,500
Metering Flow [gal]	2,500	2,500	2,500	2,500
End of Day Balance [gal]	-	-	-	-

Table 2: Barrel Wastewater Surge Calculation

Table 2 indicates that at the end of each working day the entire volume of barrel rinse wastewater can be disposed of with no remaining volume after four consecutive days.

Existing Septic Tank Capacity

There are currently five 1,500 gallon septic tanks and two 2,000 gallon septic tanks handling the process and sanitary wastewater flows; of these tanks one 1,500 gallon septic tank and one 2,000 gallon septic tank handle the sanitary sewer wastewater flows for the tasting room, "white wine" winery building and the "red wine" winery building respectively. The remaining septic tanks are also divided between the two winery buildings and processing areas; with four 1,500 gallon septic tanks handling the process wastewater flows from the interior drains of the "white wine" winery & caves and one 2,000 gallon septic tank handling the process wastewater flows from the "red wine" winery and all outdoor processing areas.

Based on the tank division described above the sanitary sewer septic tanks provide enough storage capacity to provide a minimum of five days hydraulic retention; however, the division of process wastewater septic tanks does not provide similar hydraulic retention. The four 1,500 gallon process wastewater septic tanks associated with the "white wine" winery building & caves provide a maximum of two days of hydraulic retention based on a process wastewater flow of 3,000 gpd. The one 2,000 gallon process wastewater septic tank associated with the "red wine" winery building and outdoor processing areas provides a maximum of 0.67 days or sixteen hours of hydraulic retention based on a process wastewater flow of 3,000 gpd and 0.3 days or seven hours of hydraulic retention based on a process wastewater flow of 6,700 gpd of barrel rinsate.

Proposed Septic Tank Capacity Increase

Based on the site process wastewater generation magnitude and collection areas, Bartelt Engineering recommends that a minimum two additional 2,000 gallon process wastewater septic tanks with Zabel A~~6~~300 12x36 filters be installed to operate in series with the existing 2,000 gallon septic tank that handles the "red wine" winery and outdoor processing areas to

provide a minimum of two days hydraulic retention.

Proposed Tank Requirements to Manage Barrel Rinse Wastewater

Based on a process wastewater flow of 6,700 gpd for four days, Bartelt Engineering recommends installing a 16,000 gallon process wastewater storage tank in addition to the above mentioned two 2,000 gallon process wastewater septic tanks to temporarily hold the barrel wash wastewater. The 16,000 gallon tank should be installed downstream of the existing and proposed 2,000 gallon septic tanks handling the process wastewater flows from the "red winery" building and outdoor processing areas thus utilizing the three 2,000 gallon septic tanks to capture any solids that fall out of suspension prior to the 16,000 gallon process wastewater storage tank. The barrel wash water collected in the 16,000 gallon tank will then need to be metered/pumped at 2,500 gpd (1.7± gpm) to the inlet side of the first of the four 1,500 gallon septic tanks handling the "white winery" building and caves. By utilizing the four 1,500 gallon septic tanks the hydraulic retention time for the barrel wash wastewater is 2.4 days based on a 2,500 gpd flow rate.

System Metering:

Volume of 1½ inch diameter pipe = 0.092 gal/ft of pipe length (reference COWA, 1998)

The minimum dose volume should be 5 times the volume contained in the metering line (reference COWA, 1998).

Minimum dose volume = (200 feet x 0.092 gal/ft) x (5) = 92 gallons/dose

Use a dose rate of twelve doses per day:

Dose Volume $= \frac{2{,}500 \text{ gal/day}}{12 \text{ doses/day}} = 208 \text{ gal/dose}$, the actual dose rate is greater than the minimum dose rate.

Dose Pump Run Times

$$Dose\ Pump\ Run\ Time = \frac{208 \text{ gal/dose}}{13 \text{ gpm}} = 16 \text{ minute run time}$$

$$\text{Dose Cycle Time} = \frac{1{,}440 \text{ minutes/day}}{12 \text{ cycles/day}} = 120 \text{ minute cycle time}$$

Dose Pump Off Time =

120 minute cycle time – 16 minute run time = 104 minute off time

Final operational times will need to be field adjusted based on actual flow rate.

Recommended Metering Pump Design

Pump Flow Rate = 13 gpm

Friction losses through the transmission pipe network can be calculated using the Hazen-Williams formula:

$$H_f = 10.5(L_{ft})(Q_{gpm}/C)^{1.85}(D_{in})^{-4.87}$$

The friction loss through individual pipe fittings can be estimated with tabular values of their equivalent pipe length. The resulting total length can be used in the Hazen-Williams formula to calculate the friction loss. To simplify presentation of the calculation, tabular values for a given flow and pipe length are used.

Friction loss through 1½ inch transmission pipe, fittings and pump assembly:
(reference Watkins, 1987)

Fitting	Quantity	Equiv. Length	Total Length
1½" ball valve (SCH 80)	1	1.3 ft	1.3 ft
1½" ball check valve (SCH 80)	1	19.4 ft	19.4 ft
1½" 90° ELL (SCH 40)	8	4.3 ft	34.4 ft
1½" 45° ELL (SCH 40)	8	2.4 ft	19.2 ft
1½" Tee branch (SCH 40)	1	8.7 ft	8.7 ft
1½" to 3" expansion bushing (SCH 40)	1	3.7 ft	3.7 ft
1½" SCH 40 PVC	200	1.1 ft	220.5 ft
		Total equivalent feet =	306.7 ft

Friction loss per 100 ft of 1½ inch diameter SCH 40 PVC @ 13 gpm = 0.513 psi

$$\frac{(0.513 \text{p.s.i.})}{100 \text{ ft}}(306.7 \text{ ft})\left(\frac{2.31 \text{ft } H_2O \text{ head}}{1 \text{p.s.i.}}\right) = 3.6 \text{ feet, use 4.0 foot}$$

Friction loss through flowmeter:

Friction loss through the Badger Flowmeter is based on the following calculation and the manufacturer's technical brief (see attached head loss curves).

$$H_L = (\text{pounds pressure loss})\left(\frac{2.31 \text{ft } H_2O \text{ head}}{1 \text{p.s.i.}}\right)$$

$$H_L = (0.5 \text{ p.s.i.})\left(\frac{2.31 \text{ft } H_2O \text{ head}}{1 \text{ p.s.i.}}\right) = 1.2 \text{ feet, use } 2.0 \text{ foot}$$

Total dynamic head (TDH):

TDH = friction loss through 1½ inch transmission pipe, fittings and pump assembly + friction loss through flowmeter + elevation head + head at end of transmission pipe

TDH = 4.0 feet + 2.0 feet + 31.0 feet + 1.0 feet = 38.0 feet

Add 20% for pump aging 1.20 (38.0 feet) = 45.6 feet, use 46 feet

Pump must pump 13 gpm at 46 feet of head. The engineer recommends two (2) Zoeller 810, 1.0 horsepower, 230 volt, single phase pumps or equivalent (see attached pump curve). The two pumps should be wired to run in alternating fashion to minimize the down time when a pump fails.

Conclusion

This report concludes with the following two (2) options for disposing of the barrel rinsate through the existing pressure distribution disposal field without exceeding the disposal field design parameters.

OPTION 1

Install two 2,000 gallon process wastewater septic tanks with Zabel A300 12x36 filters on the discharge end of each tank to operate in series with the existing 2,000 gallon septic tank currently handling the "red wine" winery and outdoor processing areas to provide a minimum of two days hydraulic retention. Additionally install a Tom Beard Barrel Washing System to maintain barrel rinsate to a level that can be disposed of in a twenty-four hour period to the existing pressure distribution disposal field.

OPTION 2

Install two 2,000 gallon process wastewater septic tanks with Zabel A300 12x36 filters on the discharge end of each tank to operate in series with the existing 2,000 gallon septic tank currently handling the "red wine" winery and outdoor processing area to provide a minimum of two days hydraulic retention. Additionally install a 16,000 gallon process wastewater storage tank, pumps, floats and monitoring equipment that will meter the 6,700 gallons per day of barrel rinsate through the four existing 1,500 gallon septic tanks currently handling the process wastewater from the interior drains of the "white wine" winery and caves.

As this report only studied the feasibility of disposing of the barrel rinsate through the existing pressure distribution disposal field without exceeding the disposal field design parameters, further consultation and/or engineering may be required to develop a complete design package.

If you have any questions regarding my recommendations, please feel free to call me at (707) 258-1301.

Sincerely,

Paul N. Bartelt, P.E.
Principal Engineer

PNB:sd

cc: John Komes, Flora Springs Winery
Bruce Sakai, Sakai General Engineering

STERK ENGINEERING, INC.
P.O. BOX 575
CALISTOGA, CA 94515

(707) 942-2245
FAX (707) 942-2215
email: djsterk@covad.net

PRESSURE DISTRIBUTION FIELD SUPPORT DATA

OWNER: **FLORA SPRINGS WINERY**
PROJECT#: **04-029**
PROJECT LOCATION: **1978 WEST ZINFANDEL LANE**
ST. HELENA, CA
ASSESSOR'S PARCEL #: **027-100-031**

PERCOLATION DATA

ACCEPTABLE SOIL DEPTH: 66 IN
PERCOLATION RATE: 3-6 IN/HR (USE 4"/HR) ⟶ 0.729 GAL/SF/DAY

DESIGN LOAD

SEE CHART, PAGE 3
USE 3,300.0 GALLONS/DAY

ABSORPTION AREA

3,300.00 GAL/DAY DIVIDED BY 0.729 GAL/SF/DAY (APPLICATION RATE)
= 4,526.75 SF

LINEAL FOOTAGE REQUIRED

DEPTH OF AVAILABLE TRENCH SIDEWALL = 28.0 IN
DEPTH OF EFFECTIVE TRENCH = 18.0 IN (w/ MINIMUM 36" OF ACCEPTABLE SOIL BELOW TRENCH AND 2" OF GRAVEL ABOVE LATERAL)
SIDEWALL
*** ORIFICES POINTING UP USING ORIFICE SHIELDS

SIDEWALL AREA PER LINEAL FOOT OF TRENCH = 3.00 SF

ABSORPTION AREA / SIDEWALL AREA = 4,526.75 / 3.00 = **1,509** LF

USE 1,512.0 LF (100% EXPANSION AREA REQUIREMENT = **1,509** LF)

DIVIDE SYSTEM INTO SIX EQUAL FIELDS OF 252.0 LF (TWO PUMPS FEEDING THREE SUBFIELDS EACH THRU A DISTRIBUTION VALVE)

TRENCH DIMENSIONS

AN 18 IN WIDE TRENCH WITH 18.0 IN OF 3/8 TO 3/4" DOUBLE WASHED GRAVEL BELOW LATERALS

PIPE VOLUME

LATERAL PIPE DIAMETER = 1.5 IN
LATERAL PIPE LENGTH = 252 LF
LATERAL PIPE VOLUME = 3.09 CF
= 23.14 GAL

FEEDER LINE PIPE DIAMETER = 2.0 IN
FEEDER LINE PIPE LENGTH = 700 LF

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LATERAL PIPE FLOW CALCULATIONS

LENGTH

LATERAL PIPE #1 =	84.00	LF	**(ONE FIELD ONLY)**
LATERAL PIPE #2 =	84.00	LF	
LATERAL PIPE #3 =	84.00	LF	
	252.0	**LF**	

FLOW

LATERAL PIPE #1 =	11.53	GPM	**(ONE FIELD ONLY)**
LATERAL PIPE #2 =	11.53	GPM	
LATERAL PIPE #3 =	11.53	GPM	
	34.6	**GPM**	

PIPE FRICTION (HEAD) LOSSES

LATERAL PIPE #1 =	1.07	FT	FEEDER PIPE =	**16.77**	**FT**
LATERAL PIPE #2 =	1.07	FT			
LATERAL PIPE #3 =	1.07	FT			
	3.21	**FT**			

FITTING HEAD LOSS = 8.45
(ORENCO MODEL 6403 DISTRIBUTING VALVE - OR EQUAL)

HEAD (FRICTION) =	19.98	FT	
HEAD (FITTING) =	8.45	FT	
HEAD (MISC FITTINGS) =	5.00	FT	
HEAD (ELEVATION) =	10.00	FT	
TOTAL HEAD LOSS =	**43.43**	**FT**	**(ONE FIELD ONLY)**

DESIGN DATA

PERFORATION HOLE DIAMETER =	1/8	IN
DISCHARGE HEAD @ PERF =	5	FT
HAZEN/WILLIAMS VALUE =	150	
Q (@ PERF. HOLE) =	**0.41**	**GPM**
PERFORATION SPACING =	36	IN
TOTAL PERFORATIONS =	84.0	
REQUIRED FLOW =	**34.60**	**GPM**

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WINERY CAPACITY (PROPOSED):			120,000 GALLONS
WASTEWATER (1.5 GAL EFFLUENT/1.0 GAL WINE PRODUCED)			180,000 GALLONS
60 DAY CRUSH PERIOD (>100K GALLON PRODUCTION)			
WINERY WASTE PER DAY (DURING CRUSH)			**3,000 GAL/DAY**
FULL-TIME EMPLOYEES	12	15 GPD/PER	180 GPD
PART-TIME EMPLOYEES (HARVEST)	4	7.5 GPD/PER	30 GPD
VISITORS (MAX.) PER DAY	25	2.5 GPD/PER	62.5 GPD
		DOMESTIC WASTEWATER	**273 GPD**
		TOTAL WASTEWATER PRODUCED	**3,273 GPD TOTAL**
		USE FOR NEW FIELD	***3,300 GPD***

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PD SYSTEM SUMMARY

DESIGN BASIS =	**120,000-GAL PERMITTED WINERY**	
PD DESIGN LOAD =	**3,300.00**	**GAL/DAY**
DESIGN FLOW =	**34.60**	**GPM**
DESIGN HEAD LOSS =	**43.43**	**FT**
LATERAL PIPE DIAMETER =	**1.5**	**IN**
# OF LATERALS =	**3**	**(EACH FIELD)**
SINGLE LATERAL LENGTH =	**84**	**LF**
# OF FIELDS =	**SIX**	
TOTAL LATERAL LENGTH = (PD FIELD)	**1512**	**FT**
FEEDER PIPE DIAMETER =	**2.0**	**IN**
FEEDER PIPE LENGTH =	**700.0**	**LF**
PERFORATION HOLE SIZE =	**1/8**	**IN**
PERFORATION SEPARATION =	**36**	**IN**
DOSE VOLUME FACTOR =	**6**	
DOSE VOLUME =	**138.87**	**GAL (USE 140 +/-)**
DOSE TIME =	**4.0**	**MIN**
DOSES PER DAY (EST.) =	**23.38**	
	(3.90	**EACH FIELD)**

SUMP PUMP RECOMMENDATION:
GOULDS Model 3885 (WE10H), Submersible Effluent Pump (or equal)

Sterk Engineering, Inc.
P.O. Box 575
Calistoga, CA 94515

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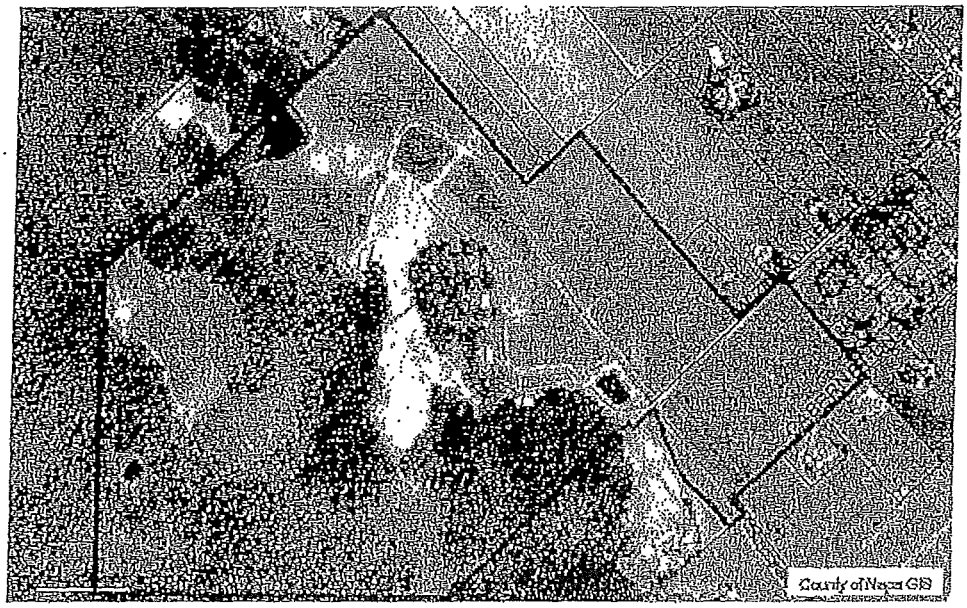
email: djsterk@covad.net



APN 027-100-031

Environmental Data	
Flood Zone:	Parcel falls within the FEMA Flood Zone
GW Ordinance:	Parcel not in Groundwater Deficient Area
	Hydrologic Region: San Francisco Bay Hydrologic Unit: San Pablo Hydrologic Area: Napa River Hydrologic Sub-Area: Napa River Super Planning Watershed: Lower Napa River Planning Watershed: Mouth of Napa River
CalWater Watershed:	Hydrologic Region: San Francisco Bay Hydrologic Unit: San Pablo Hydrologic Area: Napa River Hydrologic Sub-Area: Napa River Super Planning Watershed: Lower Napa River Planning Watershed: Bear Canyon
Local Drainage:	Bale Slough
Soil Type:	PLEASANTON LOAM, 0 TO 2 PERCENT SLOPES FORWARD GRAVELLY LOAM, 9 TO 30 PERCENT SLOPES PLEASANTON LOAM, 2 TO 5 PERCENT SLOPES HENNEKE GRAVELLY LOAM, 30 TO 75 PERCENT SLOPES MAXWELL CLAY, 2 TO 9 PERCENT SLOPES MONTARA CLAY LOAM, 5 TO 30 PERCENT SLOPES BOOMER-FORWARD-FELTA COMPLEX, 30 TO 50 PERCENT SLOPES FORWARD GRAVELLY LOAM, 30 TO 75 PERCENT SLOPES PERKINS GRAVELLY LOAM, 5 TO 9 PERCENT SLOPES

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	FORWARD GRAVELLY LOAM, 2 TO 9 PERCENT SLOPES
CalVeg:	AG NX CQ BA DF HG
Topo Quad Sheet:	Click on link to display Topo Quad Sheet

Boundary & Jurisdiction Data

USGS Quad Name:	Rutherford
Imagery:	DOQQ: rutherford_nw.lan DRG: o38122d4.tif 2002 DTM & Ortho Tile: l05 2002 DTM & Ortho Tile: m05
County Zoning:	Warning: Possible multiple zoning, Click link to view map.

120,000 GAL per year — 4 part time – 25 visitors

NAPA COUNTY DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
REQUEST FOR SITE EVALUATION INSPECTION

92-14460

ENVIRONMENTAL HEALTH DEPT. USE ONLY

FEE: 348.00
DATE: 11/4/02
RECEIPT: 24916
BY: Pedro

PARCEL NUMBER: 027-100-031
JOB ADDRESS: 1978 W. Zinfandel
OWNER: J.W. Komes
TEST CONDUCTED BY: Bruce Saikai General Eng

TYPE OF TEST: FIELD ANALYSIS ____ PERCOLATION TEST ____

To be run on 11/5/02 at 10:00 am/pm

To be run on ____ from ____ am/pm to ____ pm

PURPOSE OF TEST: HOUSE: ____ WINERY: X OTHER: ____

PROJECTED WASTEWATER FLOWS: to be determined gpd

****

PERCOLATION TEST INSPECTION RESULTS

Pre-soak checked? yes ____ no ____ Length of pre-soak: ____

Checked by: ____ Date: ____

Rate at time of inspection: ____ Stabilized perc rate: ____

Gravel and Pipe Used? yes ____ no ____ If so, take the perc rate ____ x .6 = ____ in/hr

****

TYPE OF SYSTEM APPROVED

STANDARD SYSTEM

Acceptable soil to: 66" - holes 3,4 / Assigned perc range: 1-3 / (3-6) / 6-12

Depth of trenches: 30" / Rock under pipe: 12" / Cover over rock: 12"

Lineal feet of leachline required: TBD / Plot plan received: ____

Slope: 0-2% / Surface drainage problems: none noted

Additional information: Verify drainage - is it blue line? yes - Holes 3,4 May be too close to blue line stream. Maintain 150' setback. Reserve area - Hole 1 - must install subdrain to lower water table.

SPECIAL DESIGN SYSTEM DUE TO THE FOLLOWING - Size constraints: ____

Perc rate too slow: ____ /Perc rate too fast: ____ /Steep slope: ____

Insufficient soil depth: X /High seasonal groundwater: X

Acceptable soil for special design: 48" w/ subdrain /Other problems: ____

*currently permits are not issued to cross or come within 150' of blue line streams.

E.H. Specialist Kim Withrow Date 11/6/02

FIELD ANALYSIS

TEXTURE (In the proposed trench zone)

CLAY CONTENT

Core Hole	1	2	3	4	5	6
Low (<12)						
Mod (12-27)			X	X		
High (27-40)	X	X				
High (>40)						

SAND CONTENT

Core Hole	1	2	3	4	5	6
High (>50)			X	X		
Mod (20-50)						
Low (<20)	X	X				

GRAVEL, COBBLE, STONE CONTENT

Core Hole	1	2	3	4	5	6
Very High (>60)						
High (35-60)						
Mod (15-35)						
Low (<15)	X	X	X	X		

* *

STRUCTURE

SOIL DENSITY WHEN PICKED (Circle whether wet or (dry))

Core Hole	1	2	3	4	5	6
pick sluffs or caves soil in			X	X		
pick bites and soil sluffs	X	X				
pick bites/ little or no soil sluffs						

CONSISTENCE (Circle w or (d))

Core Hole	1	2	3	4	5	6
Easy			X	X		
Moderate	X	X				
Hard						

STRUCTURE

Core Hole	1	2	3	4	5	6
Granular						
Blocky	X	X	X	X		
Prism						
Platy						
Massive						
Cemented						

MODIFIER CHARACTERISTICS

1) Soil Survey Name: _____

2) Horizon Boundaries: Diffuse ___ Gradual ___ Abrupt ___

3) Topography: Concave _____ Convex _____ / Aspect: _____

4) Vegetation: Type vineyard Condition: _____

* *

CORE HOLE RECORD (below winery)

HOLE #1

		EST. PERC
0" to	28" clay loam	1-3
28" to	48" denser clay loam	K-3
48" to	66" sandy clay loam (moist)	1-3

Roots: to bottom
Color: (bright) / dull
Water Table: high chroma at 42"
Dug: (easy) / hard / dusty / smear
Acceptable Soil To: 42"
glying & mottling at 48"

HOLE #2

		EST. PERC
0 to	32" clay loam	1-3
32" to	46" heavy clay	<1
___ to		

Roots:
Color: bright / dull
Water Table:
Dug: easy / (hard) / dusty / smear
Acceptable Soil To: 32"

HOLE #3

		EST. PERC
0 to	24" sandy clay loam (slightly gravelly)	3-6
24" to	42" sandy loam/ loamy sand	6-12
42" to	66" sandy loam	6-12

Roots: to bottom
Color: (bright) / dull
Water Table: not noted
Dug: (easy) / hard / dusty / smear
Acceptable Soil To: 66"

CORE HOLE RECORD

HOLE #4

		EST. PERC
0 to	24" sandy clay loam	3-6
24" to	66" silt loam	3-6
___ to		

Roots: to bottom
Color: bright / dull
Water Table: not noted
Dug: (easy) / hard / dusty / smear
Acceptable Soil To: 66"

HOLE #5

		EST. PERC
___ to		
___ to		
___ to		

Roots:
Color: bright / dull
Water Table:
Dug: easy / hard / dusty / smear
Acceptable Soil To:

HOLE #6

		EST. PERC
___ to		
___ to		
___ to		

Roots:
Color: bright / dull
Water Table:
Dug: easy / hard / dusty / smear
Acceptable Soil To:

NAPA COUNTY DEPARTMENT OF ENVIRONMENTAL MANAGEMENT 92-14460
REQUEST FOR SITE EVALUATION INSPECTION

IRONMENTAL HEALTH DEPT. USE ONLY

E: CONTINUATION

TE:

CEIPT:

Y:

PARCEL NUMBER: 27-100-031

JOB ADDRESS: 1978 W. BINFANDEL

OWNER: KONES

TEST CONDUCTED BY: SAKAI

YPE OF TEST: FIELD ANALYSIS ____

o be run on ____ at ____ am/pm

PERCOLATION TEST ____

To be run on ____ from ____ am/pm to ____ pm

URPOSE OF TEST: HOUSE: ____ WINERY: X OTHER: ____

ROJECTED WASTEWATER FLOWS: TBD gpd

****

PERCOLATION TEST INSPECTION RESULTS

Pre-soak checked? yes ____ no ____ Length of pre-soak: ____

cked by: ____ Date: ____

Rate at time of inspection: ____ Stabilized perc rate: ____

Gravel and Pipe Used? yes ____ no ____ If so, take the perc rate ____ x .6 = ____ in/hr

****

TYPE OF SYSTEM APPROVED

STANDARD SYSTEM EXCLUDING HOLE #2

Acceptable soil to: 66" / Assigned perc range: 1-3 / (3-6) / 6-12

Depth of trenches: 30" / Rock under pipe: 12" / Cover over rock: 12"

Lineal feet of leachline required: TBD / Plot plan received: NEED

Slope: +/- 5% / Surface drainage problems: NO

Additional information: BLUE LINE CREEK 150' AWAY

C

SPECIAL DESIGN SYSTEM DUE TO THE FOLLOWING - Size constraints: ____

Perc rate too slow: ____ /Perc rate too fast: ____ /Steep slope: ____

fficient soil depth: ____ /High seasonal groundwater: ____

Acceptable soil for special design: ____ /Other problems: ____

____ Specialist [signature] Date 11/21/02

FIELD ANALYSIS

TEXTURE (In the proposed trench zone)

CLAY CONTENT

Core Hole	1	2	3	4	5	6
Low (<12)		X				
Mod (12-27)	X		X	X		
High (27-40)						
High (>40)						

SAND CONTENT

Core Hole	1	2	3	4	5	6
High (>50)		X				
Mod (20-50)	X		X	X		
Low (<20)						

GRAVEL, COBBLE, STONE CONTENT

Core Hole	1	2	3	4	5	6
Very High (>60)		X				
High(35-60)						
Mod (15-35)	X		X	X		
Low (<15)						

* *

STRUCTURE

SOIL DENSITY WHEN PICKED (Circle whether wet or dry)

Core Hole	1	2	3	4	5	6
pick sluffs or caves soil in						
pick bites and soil sluffs	X	X	X	X		
pick bites/ little or no soil sluffs						

CONSISTENCE (Circle w or d)

Core Hole	1	2	3	4	5	6
Easy						
Moderate	X	X	X	X		
Hard						

STRUCTURE

Core Hole	1	2	3	4	5	6
Granular		X				
Blocky	X	X	X	X		
Prism						
Platy						
Massive						
Cemented						

MODIFIER CHARACTERISTICS

1) Soil Survey Name: _____

2) Horizon Boundaries: Diffuse ___ Gradual X Abrupt ___

3) Topography: Concave ___ Convex SLIGHT X / Aspect: W

4) Vegetation: Type VINEYARD Condition: HEALTHY

* *

CORE HOLE RECORD

#5 HOLE #1 EST. PERC

0 to 18" TIGHT GRAVELLY SANDY CLAY LOAM 3-6"

18" to 36" GRAVELLY SANDY CLAY LOAM 3-6"

36" to 66" COBBLY CLAY LOAM 3-6"

Roots: 42"
Color: bright / dull
Water Table: NO
Dug: easy / hard / dusty / smear
Acceptable Soil To: 66"

#6 HOLE #2 EST. PERC

0 to 36" SAME AS #1 3-6"

36" to 60" SANDY GRAVEL, COBBLES >62"

___ to ___

Roots: 42"
Color: bright / dull
Water Table: NO
Dug: easy / hard / dusty / smear
Acceptable Soil To: 36"

#7 HOLE #3 EST. PERC

0 to 48" SAME AS #1 3-6"

48" to 66" VERY TIGHT CLAY LOAM 1-3

___ to ___

Roots: 48"
Color: bright / dull
Water Table: NO
Dug: easy / hard / dusty / smear
Acceptable Soil To: 66"

CORE HOLE RECORD

#8 HOLE #4 EST. PERC

0 to 66" SAME AS #1 3-6"

___ to ___

___ to ___

oots: ___
lor: bright / dull
Water Table: ___
Dug: easy / hard / dusty / smear
Acceptable Soil To: 66"

HOLE #5 EST. PERC

___ to ___

___ to ___

___ to ___

Roots: ___
Color: bright / dull
Water Table: ___
Dug: easy / hard / dusty / smear
Acceptable Soil To: ___

HOLE #6 EST. PERC

___ to ___

___ to ___

___ to ___

Roots: ___
Color: bright / dull
Water Table: ___
Dug: easy / hard / dusty / smear
Acceptable Soil To: ___

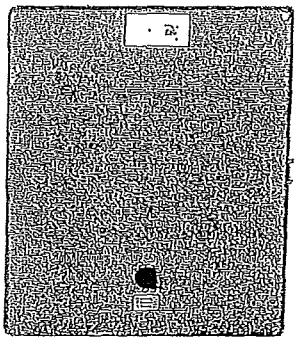
Duplex Control Panels

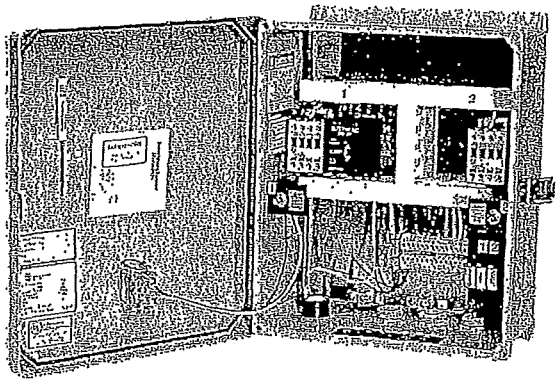
Submittal Data Sheet

Orenco Systems®
Incorporated
1-800-348-9843

Applications

Orenco Duplex Control Panels are used to control dual pumps, alarms, and other equipment as specified in pressure sewers and onsite septic systems.





General

Orenco Duplex Control Panels are specifically engineered for pressure sewer (STEP) systems and onsite septic treatment systems that require the use of two alternating pumps. Standard features include circuit breakers, an automatic/manual/off motor control toggle for each pump, an audio/visual high level alarm, reset, and a duplex alternator. Other standard features and options are listed on page 2. Orenco Panels are designed for use with mechanical and/or mercury float switches. Listed per UL 508; a UL-Canada listing is available.

Standard Models

DAX1, DAX2

Nomenclature

DAX□ □□□

- □□□ — Indicates selected options (see page 2)
- □ — Indicates voltage
  - 1 = 120 VAC
  - 2 = 240 VAC

Specifications

Feature	Specification(s)
Panel Enclosure:	Measures 15.5" high x 13.3" wide x 6.7" deep. NEMA 4X rated. Constructed of UV resistant fiberglass; hinge and latch are stainless steel.
DAX1 Panel Ratings:	120 VAC, 3/4 hp, 14 amps, single phase, 60 Hz.
DAX2 Panel Ratings:	240 VAC, 2 hp, 14 amps, single phase, 60 Hz.

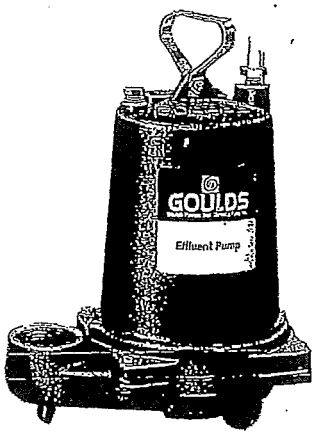
Duplex Control Panels (continued)

Standard Features

Feature	Specification(s)
Motor-Start Contactor	120 VAC: 14 FLA, 3/4 hp, 60 hz; 2.5 million cycles at FLA (10 million at 50% of FLA). 240 VAC: 14 FLA, 2 hp, 60 hz; 2.5 million cycles at FLA (10 million at 50% FLA).
Pump Circuit Breakers	20 amps, OFF/ON switch. Single pole 120 VAC, double pole 240 VAC. DIN rail mounting with thermal magnetic tripping characteristics.
Controls Circuit Breaker	10 amps, OFF/ON switch. Single pole 120V. DIN rail mounting with thermal magnetic tripping characteristics.
Toggle Switches	Single pole-double throw HOA switch rated at 20 amps.
Audio Alarm	95 dB at 24", warble-tone sound.
Audio Alarm Silence Relay	120 VAC, automatic reset. DIN rail mount.
Visual Alarm	7/8" diameter red lens, "Push-to-silence." NEMA 4X, 1 Watt bulb, 120 VAC.
Duplex Alternator	120 VAC, cross wired style for independent lag pump function. Selector switch for locking one pump into lead position.

Optional Features

Feature	Specification(s)	Product Code Adder
Intrinsically Safe Control Relays	120 VAC. Listed per UL 698A, for Class 1 Div. 1, groups A, B, C, D hazardous locations. Larger enclosure required.	IR
Programmable Timer	120 VAC, Repeat cycle from 0.05 seconds to 30 hours. Separate variable controls for OFF & ON time periods.	PT
Redundant Off Relay	120 VAC, provides a secondary off. Sounds alarm on low level condition. DIN rail mount.	RO
Heater	Anti-condensation heater. Self-adjusting: radiates additional wattage as temperature drops.	HT
Elapsed Time Meter	120 VAC, 7-digit, non-resettable. Limit of 99,999 hours; accurate to 0.01 hours.	ETM
Event Counter	120 VAC, 6-digit, non-resettable.	CT
Pump Run Light	7/8" green lens. NEMA 4X, 1 Watt bulb, 120 VAC.	PRL



Goulds Submersible Effluent Pump

MODEL

3885

APPLICATIONS

Specifically designed for the following uses:

- Homes
- Farms
- Trailer courts
- Motels
- Schools
- Hospitals
- Industry
- Effluent systems

SPECIFICATIONS

Pump

- Solids handling capabilities: ¾" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 128 GPM.
- Total heads: up to 123 feet TDH.
- Mechanical seal: silicon carbide-rotary seat/silicon carbide-stationary seat, 300 series stainless steel metal parts, BUNA-N elastomers.
- Temperature: 104°F (40°C) continuous 140°F (60°C) intermittent.
- Fasteners: 300 series stainless steel.
- Capable of running dry without damage to components.

Motor

Single phase:

- ⅓ HP, 115 V, 200 V, 230 V, 60 Hz, 1750 RPM; ½ HP, 115 V, 60 Hz, 3500 RPM; ½ HP – 1½ HP, 230 V, 60 Hz, 3500 RPM.
- Built-in overload with automatic reset. Class B insulation.

Three phase:

- ½ HP – 1½ HP 200/230/460 V, 60 Hz, 3500 RPM.
- Class B insulation.
- Overload protection must be provided in starter unit.
- Shaft: threaded, 400 series stainless steel.
- Bearings: ball bearings upper and lower.
- Power cord: 20 foot standard length (optional lengths available).

Single phase:

- ⅓ and ½ HP – 16/3 SJTO with 115 V or 230 V three prong plug.
- ¾-1½ HP – 14/3 STO with bare leads.

Three phase:

- ½-1½ HP – 14/4 STO with bare leads. On CSA listed models – 20 foot length SJTW and STW are standard.

FEATURES

■ **Impeller:** Cast iron, semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.

■ **Casing:** Cast iron volute type for maximum efficiency. 2" NPT discharge adaptable for slide rail systems.

■ **Mechanical Seal: SILICON CARBIDE VS. SILICON CARBIDE** sealing faces. Stainless steel metal parts, BUNA-N elastomers.

■ **Shaft:** Corrosion-resistant stainless steel. Threaded design. Locknut on three phase models to guard against component damage on accidental reverse rotation.

■ **Motor:** Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.

■ **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage.

■ **Bearings:** Upper and lower heavy duty ball bearing construction.

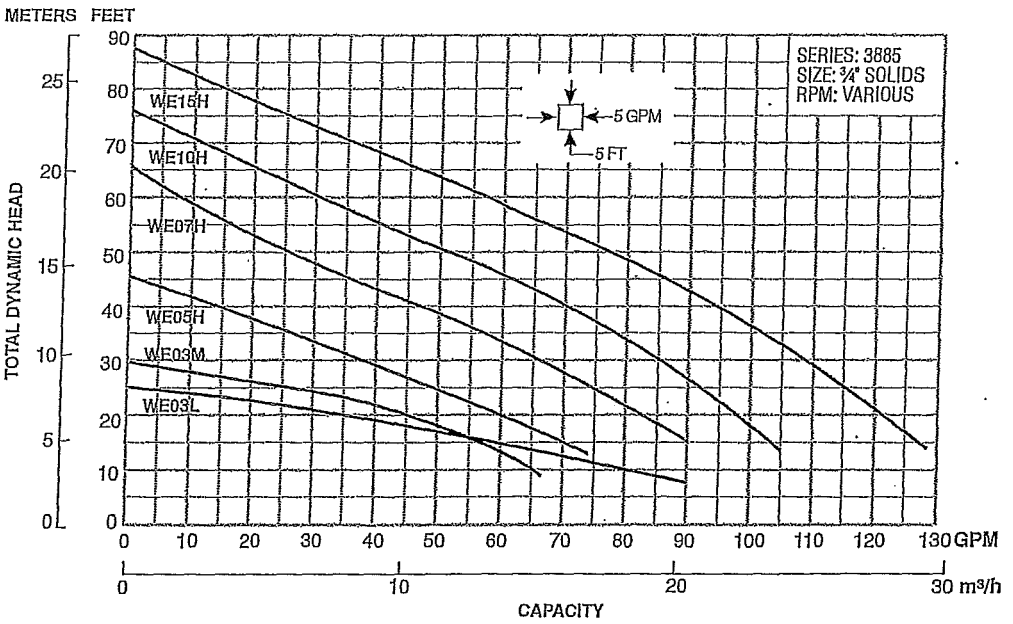
■ **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking.

■ **O-ring:** Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS

Canadian Standards Association

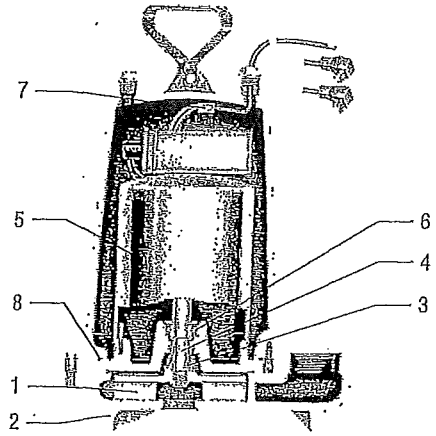
Underwriters Laboratories



Effective May, 1995
B3885

PARTS

Item No.	Description
1	Impeller
2	Casing
3	Mechanical seal
4	Shaft
5	Motor
6	Bearings – upper and lower
7	Power cable
8	O-ring



Goulds Submersible Effluent Pump

MODEL

3885

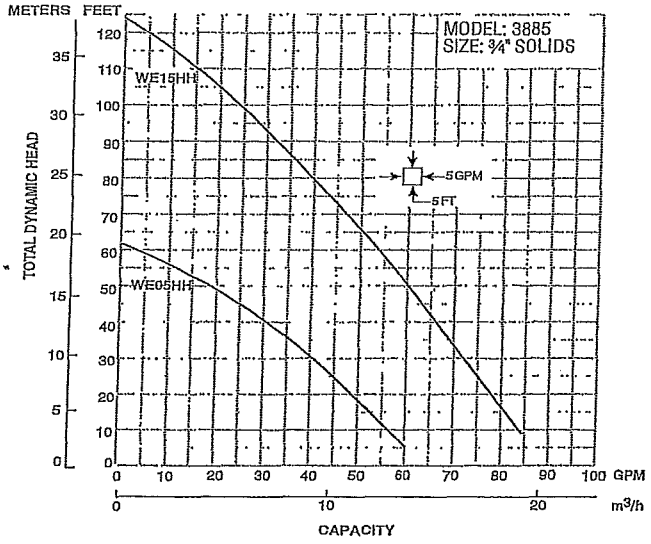
MODELS

Order No.	HP	Volts*	Phase	Max. Amp.	RPM	3ø Heater Size	Wt. (lbs.)
WE0311L	⅓	115	1	9.4	1750	N/A	56
WE0312L		230		4.7			
WE0318L		200		5.4			
WE0311M		115		9.4			
WE0312M		230		4.7			
WE0318M		200		5.4			
WE0511H	½	115	1	14.5	3500	N/A	60
WE0512H		230		7.3			
WE0518H		200		8.4			
WE0538H		200	3	3.9		K32	
WE0532H		230		3.4		K32	
WE0534H		460		1.7		K21	
WE0511HH		115	1	14.5		N/A	
WE0512HH		230		7.3			
WE0518HH		200		8.4			
WE0538HH		200	3	3.8		K32	
WE0532HH		230		3.3		K31	
WE0534HH		460		1.65		K21	
WE0712H	¾	230	1	10.0		N/A	70
WE0718H		200		11.5			
WE0738H		200	3	6.2		K49	
WE0732H		230		5.4		K39	
WE0734H		460		2.7		K28	
WE1012H	1	230	1	12.5		N/A	
WE1018H		200		14.4			
WE1038H		200	3	8.1		K43	
WE1032H		230		7.0		K43	
WE1034H		460		3.5		K32	
WE1512H	1½	230	1	15.7		N/A	80
WE1538H		200	3	10.6		K53	
WE1532H		230		9.2		K50	
WE1534H		460		4.6		K36	
WE1512HH		230	1	15.0		N/A	
WE1538HH		200	3	10.6		K53	
WE1532HH		230		9.2		K50	
WE1534HH		460		4.6		K36	

* For 575 V consult factory.

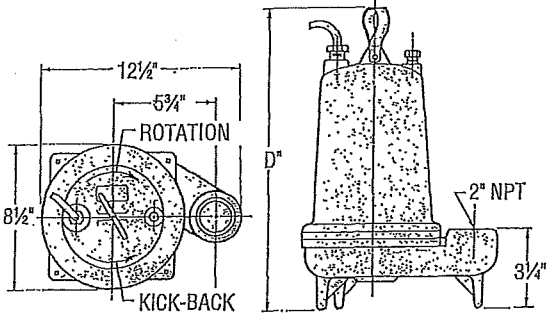
PERFORMANCE RATINGS (gallons per minute)

Total Head Feet of Water	Order No.	WE0311L WE0312L WE0318L	WE0311M WE0312M WE0318M	WE0511H WE0512H WE0538H WE0532H WE0534H WE0518H	WE0712H WE0738H WE0732H WE0734H WE0718H	WE1012H WE1038H WE1032H WE1034H WE1018H	WE1512H WE1538H WE1532H WE1534H	WE0511HH WE0512HH WE0538HH WE0532HH WE0534HH WE0518HH	WE1512HH WE1538HH WE1532HH WE1534HH
	HP	⅓	⅓	½	¾	1	1½	½	1½
	RPM	1750	1750	3500	3500	3500	3500	3500	3500
	5	–	–	–	–	–	–	60	–
	10	80	65	–	–	–	–	56	84
	15	60	57	69	90	104	128	53	82
	20	36	45	60	83	98	122	48	77
	25		25	50	76	92	116	45	75
	30			38	67	85	109	40	72
	35			26	58	78	102	35	70
	40			15	47	70	94	30	67
	45				36	62	86	25	64
	50				25	52	77	18	60
	55				17	42	67	12	58
	60				8	32	56	3	54
	65					21	46		51
	70					11	35		47
	75						25		43
	80						15		40
	90								33
	100								24
	110								15
	120								5



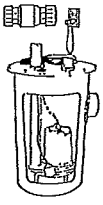
DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)
D* ⅓, ½, ¾ and 1 HP = 15"
except for model WE0712H and WE1012H = 18"; 1½HP = 18"



EFFLUENT EJECTOR SYSTEM

Effluent ejector system offers ease of ordering and installation. A single ordering number specifies a complete system designed for most residential and commercial sump and effluent pump applications.



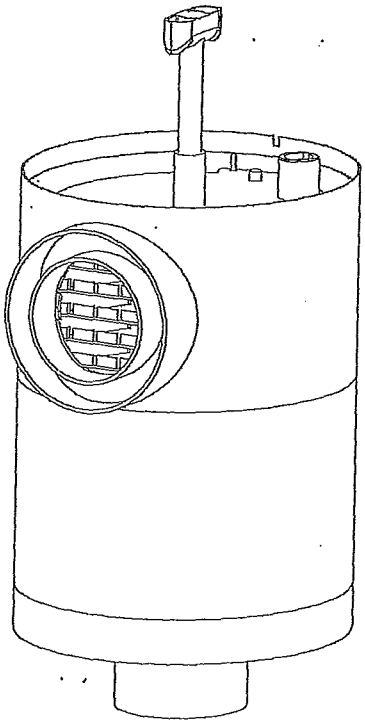
Package Includes:
Submersible Effluent Pump WE0311L, 12L or WE0311M, 12M, WE0511HH, 12HH
Mechanical Level Control Switch
A2-5 (115V), A2-6 (230V)
Basin A7-1801S, Basin Cover A8-1822
Check Valve A9-2P
Order No.: SWE0311L, SWE0312L, SWE0311M, SWE0312M, SWE0511HH, SWE0512HH.

GOULDS PUMPS, INC.
WATER TECHNOLOGIES GROUP
SENECA FALLS, NEW YORK 13148

Effluent Filters

Filter Series (A300™-12 Series)

A300-12x20-VC, A300-12x28-VC, A300-12x36-VC



Product Information 054 / Pricing 204

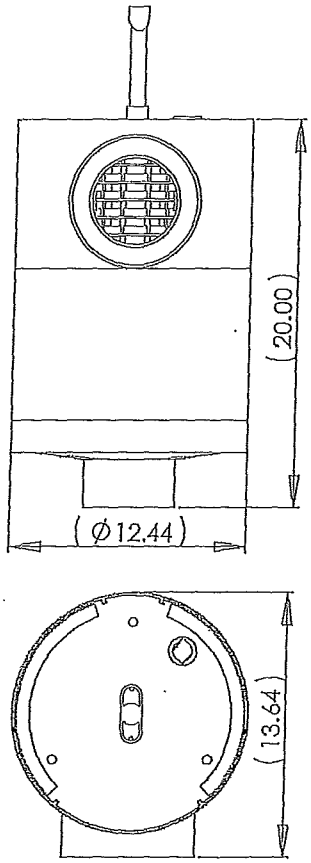
Features

- Ideal effluent filter for use in grease traps, dog kennels, beauty shops, and laundromats
- Average of 50% to 90% reduction in TSS within 6 months of installation
- Average of 20% to 45% reduction in BOD_5 within 6 months of installation, reduction is dependent on the make-up of the wastewater
- Average of 60% to 90% reduction in FOG within 6 months of installation

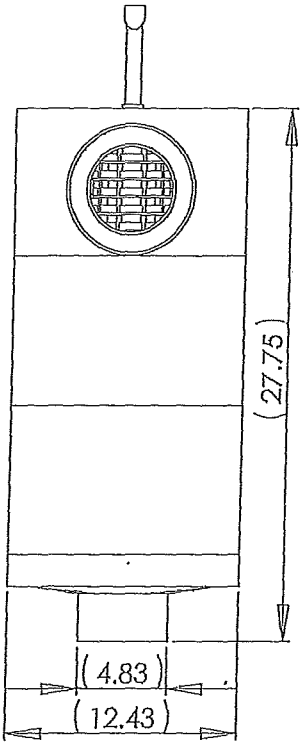
NSF

Residential Application Certified to ANSI/NSF STANDARD 46

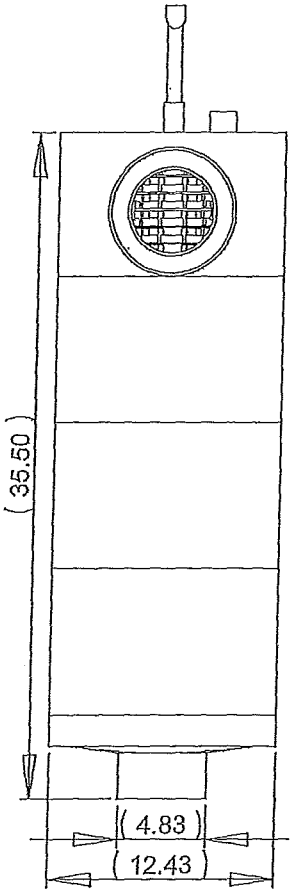
A300-12x20-VC



A300-12x28-VC



A300-12x36-VC



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